

US-PAT-NO: 6066129  
DOCUMENT-IDENTIFIER: US 6066129 A  
TITLE: Medical laser control system

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Detailed Description Text - DETX (13):

It is of course possible, but not necessary, that the displays be provided in the form of a heads up display directly in the loupe or the protective eyewear worn by the surgeon. Methods of providing such a display are well known and need not be discussed in detail here. Reference may be made to simple systems such as the large multi-element LED as disclosed in U.S. Pat. No. 5,423,215 (Frankel) concerning a self-contained heads-up visual altimeter display for skydiving. However, it is difficult for the surgeon to change focus between the patient, who may be 18 inches or more from the surgeon, to the LED, which may be two inches from the eyes of the surgeon. Thus, for all but the most basic "on-off" indications which can be signaled by the on-off condition of a LED, the display is preferably placed at approximately the same focal distance from the eyes as the patient, which placement may be accomplished in a compact manner by use of mirrors as disclosed in U.S. Pat. No. 5,033,808 (Barr). Barr discloses a diver information system that displays information in the diver's line of sight without substantially obstructing his vision. The diver's system includes a microprocessor, and has an input capability that allows a diver to select one or more dive parameters before a dive. A plurality of sensors, connected to the

microprocessor, are provided to monitor parameters such as air tank pressure, depth and water temperature. The system monitors these parameters during the ensuing dive, and provides warnings upon any of a variety of conditions occurring, such as if one or more of the parameters are violated. Throughout the dive, the system periodically stores dive data and any warnings (if present) in a static RAM. Subsequent to the dive, the stored information can be downloaded into an external computer through a provided external port. The display system of the preferred embodiment includes an LED display that is reflected from a red reflecting mirror affixed to the diver's face mask so that the image of the LEDs is positioned well within the diver's line of sight, but appears to be at a comfortable viewing distance from the diver's eyes, this distance being greater than the distance from the eyes to the mirror. Thus, simply by looking through his face mask, the diver can continuously monitor a display of pertinent dive information such as depth and water temperature, as well as essential information such as air tank pressure. This system is described in great detail in the Barr patent, and the same basic system including the arrangement, circuitry, display elements, alarms, and memory for storing information, can be easily adapted to the present invention for providing a heads-up display in surgical eyewear or a surgical loupe. Thus, the teachings of this patent are expressly incorporated herein by reference.

Detailed Description Text - DETX (74):  
Speech Recognition and Spoken Alarms

Detailed Description Text - DETX (75):

Speech recognition programs are well known and any of a variety of programs can easily be adapted for use with the present invention.

An example of such a system is the speech controlled vehicle alarm system as disclosed in U.S. Pat. No. 5,706,399 (Bareis). This system allows control of alarm functions to be accomplished using specific spoken commands. A microphone converts speech into time variant voltage levels which are amplified and sent to an analog-to-digital converter and digitized. The digitized data is then processed by a speech recognition subsystem. The speech recognition subsystem separates extraneous speech from words (commands) and provides corresponding output signals when control words are recognized. While the output signals are used in this patent to operate door locking and unlocking controls, to operate a loud siren, to operate vehicle light controls, to provide an engine cut-off control, to provide an engine starting control, or to operate a response indicator incorporated in the main alarm processing unit, it will be easily appreciated that the same system may be used in the operating room to control laser beam CPG pattern selection, pattern width, beam intensity, or to respond to spoken status inquiries. Response to spoken inquiries may be by either presenting an updated or selected visual display, or by providing a spoken status. Spoken status or alarms may be provided by pre-programmed micro-chips, or for greater flexibility may be provided by a computer program including a speaking program. Examples of such computer programs include "VoiceType.TM. Simply Speaking" by IBM and "Power Translator.RTM." by Globalink. Further examples of voice recognitions include U.S. Pat. No. 5,664,061 (Andreshak, et. al.) teaching an interactive computer system recognizing spoken commands.

Claims Text - CLTX (17):

12. A medical laser system as in claim 11, wherein one of said main operator interface console and remote operator interface console are controlled via voice recognition.